

MATH 419A LONG-TERM ACTUARIAL MATHEMATICS I
FALL 2020 (Sept 9 to Nov 13)

Instructor: Dr. Sooie-Hoe Loke
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Zoom Office Hours: MTWTh 2-2:30PM and by email

Contacting the Instructor: The best way to contact me is via direct email or message using the Canvas inbox. I will do my best to respond within 24 hours (or sooner) during the work week. We can also meet via Zoom during my scheduled office hours.

Required Text: Dickson, D. C., Hardy, M., Hardy, M. R., & Waters, H. R. (2020). *Actuarial mathematics for life contingent risks*. Third edition. Cambridge University Press. We'll be covering Chapters 1-6 this quarter.

You may also use the second edition, but it is your sole responsibility to make sure that the corresponding chapters and homework problems are consistent with the third edition.

Course Goals: Upon successful completion of this course, the student will be able to:

- Compare and contrast long-term coverages in insurance (life, health, general) and retirement benefits (pensions, retiree health care).
- Estimate survival models using nonparametric methods.
- Formulate Markov chain survival models.
- Estimate model quantities using approximations for fractional ages.
- Design an appropriate actuarial model for a given situation or application.
- Assess the appropriateness of an actuarial model for a given application.

Prerequisite: MATH 411C and MATH 418C, or permission.

Course Assessment: Your overall grade will be determined by the following:

- Exams (60% total); There will be two midterm exams with tentative dates: Between Week 4 – Week 5 and between Week 8 – Week 9. Exact dates will be announced at least a week ahead.
The final exam is optional and if you opt to take it, the final is worth 25% and the midterms are worth 17.5% each.
- Book problems (20%); see below for more information.
- Problem sets (20%); see below for more information.

Course grades will be assigned based upon the following scale:

93-100%=A	90-92.9%=A-	87-89.9%=B+	83-86.9%=B	80-82.9%=B-	77-79.9%=C+	73-76.9%=C
70-72.9%=C-	67-69.9%=D+	63-66.9%=D	60-62.9%=D-	below 60%=F		

The instructor reserves the right to adjust the above scale (in the student's favor) if deemed appropriate.

Required calculator: A scientific or graphing calculator is also required. If you are planning to take Exam LTAM (see below), some recommended calculators are TI-30Xa, TI-30X II (IIS solar or IIB battery), or TI-30XS MultiView (or XB).

Exam LTAM: The 419ABC sequence covers the SOA Exam LTAM material. For more information regarding Exam LTAM, see <https://www.soa.org/Education/Exam-Req/edu-exam-ltam-detail.aspx>

Course structure: Every week, lecture videos will be posted on Canvas via Panopto. Go to the course Canvas page and click "Panopto Recordings" on the left navigation menu. The corresponding slides will be posted on Canvas under "Files". Please watch these videos before attempting the weekly homework assignments.

Exams: The exams are closed-book, closed-note, and closed-internet. It would be considered cheating to make use of those resources. You are also not allowed to share any information about the content of the exam with others. You will be asked to sign an integrity statement at the beginning of each exam. Exams will be given via the "Quizzes" feature in Canvas and will be made available from 6AM to 11PM on the day of the exam. Please note that once you begin, the exam will not be paused even if you navigate away from the page. Make sure that you have a calculator and have plenty of scratch papers. You will be provided some extra time so that you can scan and upload your exam on Canvas as a pdf file. If Canvas is temporarily down in the middle of your exam or if there are other technological difficulties, please email your exam to me.

Any changes to the tentative exam schedule will be announced in advance. Make-up arrangements must be made at least three days prior to an exam unless you can document an unexpected circumstance beyond your control that prevented you from taking the exam.

Homework: There will be two types of homework: Book problems and problem sets. Book problems consist of exercises from the textbook, and will be primarily graded based on completion. Problem sets are composed of more advanced exercises, which supplement the book problems and focus on Exam LTAM problem-solving skills. The problem sets will be graded based on accuracy and precision. Please treat both types of assignments with equal importance.

Homework must be done neatly and submitted through Canvas as a single pdf file. Many smartphones have built-in functions to convert pictures to pdf files. In addition, here is a list of some apps with scanning capability: Adobe Scan, Cam Scanner, Microsoft Office Lens, Tiny Scanner. Your work should be clear, in a logical order, and provide sufficient explanation. Credit will not be given for late homework. You are welcome to work with others and to consult books, but your solutions must be written up in your own words. All your collaborators and sources should be listed. Credit will not be given to any party for work which is identical.

Academic Honesty: Consult university policies ([CWUP 5-90-040\(22\)](#), [CWUR 2-90-040\(22\)](#), and [WAC 106-125-020](#)) for student conduct, cheating, plagiarism, and other academic expectations. CWU's policies and recommendations for academic misconduct will be followed, leading to disciplinary action up to and including failing the course.

Diversity Statement: CWU expects every member of the university community to contribute to an inclusive and respectful culture for all in its classrooms, work environments, and at campus events. As a student in this course, you are expected to treat your professors, fellow students, and other people affiliated with your work at CWU with respect, regardless of their sex, race and color, religion and creed, national origin, sexual orientation, gender identify and gender expression, disability and use of assistive devices or a service animal, and veteran or military status.

Disability Support Services: CWU is committed to creating a learning environment that meets the needs of its diverse student body. Students with disabilities should contact Disability Services to discuss a range of options to removing barriers, including accommodations: Hogue Hall 126, (509) 963-2214, ds@cwu.edu

Religious Holiday Absences: In compliance with RCW 28B.137.010, CWU makes every effort to deal reasonably and fairly with students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Students must present written notice to their instructor within the first two weeks of class listing the specific dates on which accommodations are required. Contact the Dean of Student Success at (509) 963-1515 for further information or questions.

Expectations for Student Conduct: Students in this class are expected to interact with students and the professor professionally. Instances of disruptive conduct, obstructive conduct, or harassment will be referred to the Dean of Student Success.

COVID-19 Statement and Resources: Due to COVID-19 and under the directive and mandate of public health officials and the president of Central Washington University, students must adopt face covering protocol before entering any classroom or building at CWU until further notice. Students must also follow the social distancing placement marks in buildings and classrooms. If you do not have a face covering Central Washington University can provide one for you. If you have not yet received your CWU-supplied facial covering, please go the SURC Information Desk. Please do so prior to the start of your first class.

Stress and other life circumstances that may be out of your control can make learning and focusing difficult. If you find stress or other mental health concerns make academics difficult, Central has resources to support you. I encourage you to reach out to the following resources as soon as you notice you're struggling:

- CWU Counseling Center: <https://www.cwu.edu/medical-counseling/counseling-clinic>
- Mental Health Crisis Support outside normal business hours: 1-800-273-8255, Text HOME to 741741 or call 911.
- Wellness Center: <https://www.cwu.edu/wellness/> 509-963 -3213
- Student Rights and Responsibilities: <https://www.cwu.edu/student-rights/office-student-rights-responsibilities>

The instructor reserves the right to change the policies contained in this syllabus as dictated by developments during the quarter. Changes will be announced via email and on Canvas.